When it is desired to remove the mirror from the telescope the tube is turned to a vertical position, and a carriage running on rails is brought under it and raised to the required height to receive the cell as it is unbolted from the tube. As the mirror and cell weigh almost 6 tons, a steel strut, running in vertical guides below the floor and counterweighted so as to be easily raised or lowered, is brought up and placed under the other end of the declination axis to prevent it from sinking downwards.

The entire mass of the moving parts is 45 tons, and yet it moves with the greatest ease and smoothness. A small pressure on the upper end of the tube suffices to put it in motion, while the power required to move the telescope at quick speed over that required by the motors when running idle is about 50 watts. The electric power required for the various purposes at the observatory is obtained from the British Columbia Electric Railway, which runs along the foot of the hill. By means of a motor-generator it is transformed from three-phase alternating to direct current at 220 volts.

The great mirror is not yet completed. It is 73 in. in diameter, 12 in. thick at the edge, and weighs 4340 lb. The face was made spherical some time ago, and work on parabolising it is proceeding. This has been delayed through the lack of a sufficiently large plane mirror for testing. Such a mirror has been under construction for some time by the John A. Brashear Co., which expects to have the great mirror completed by the spring, in which case the regular work of the observatory will begin next summer.

The mounting and adjusting of the telescope were under the immediate direction of Dr. Plaskett. Indeed, the entire project must be considered largely his own creation. It was he who first proposed it, and his enthusiastic advocacy of it led the authorities to approve of its construction; his experience as an observer and his great mechanical skill have had much to do with the perfection of the instrument; and his energy is shown in the rapid progress which has been made.

C. A. CHANT.

## NOTES.

THE New Year Honours List, the publication of which had been postponed, was issued on Monday, and contains, among others, the following names:—Dr. R. Armstrong-Jones, Prof. R. Lodge, Edinburgh, Mr. Y. L. Raven (formerly chief mechanical engineer of the North-Eastern Railway Co.), and Prof. P. Vinogradoff, Oxford (the honour of knighthood); Dr. A. Newsholme (K.C.B.); Sir Cecil Harcourt-Smith, Victoria and Albert Museum (C.V.O.); Dr. F. Watts, Imperial Commissioner of Agriculture for the West Indies (K.C.M.G.); Mr. L. Rodway, Government Botanist, Tasmania (C.M.G.). A later list states that the honour of knighthood has been conferred upon Prof. Jagadish Chandra Bose, of Calcutta, and Rai Bahadur Sundar Lal, Vice-Chancellor of the Benares Hindu University.

THE committee of the Athenæum Club has elected the following under the provisions of the rule of the club which empowers the annual election by the committee of a certain number of persons "of distinguished eminence in science, literature, the arts, or for public services":—Sir R. Hadfield, Field-Marshal Sir Douglas Haig, and Prof. G. Gilbert A. Murray.

THE Advisory Council of the Government's Department of Scientific and Industrial Research has added to the list of its technical committees a Standing Committee on Glass and Optical Instruments. The membership of the committee is at present as follows: Prof. H. Jackson (chairman), Mr. Conrad Beck, Prof. C. V. Boys, Mr. F. J. Cheshire, Mr. A. E. Conrady, Mr. A. S. Esslemont, Mr. J. W. French, Dr. R. T. Glazebrook, Sir Howard Grubb, Mr. E. B. Knobel, Dr. T. R. Merton, Prof. J. W. Nicholson, Capt. Creagh Osborne, Mr. H. J. Stobart, Mr. J. Stuart, Mr. M. P. Swift, Mr. W. Taylor, Mr. F. Twyman, Lt.-Col. A. C. Williams, and Mr. W. F. J. Wood. The committee, having regard to the urgency of the problems requiring investigation in respect of these essential industries, has appointed a series of sub-committees to which various special problems have been referred. Among these problems the more important are: (*a*) Raw materials for glass and glass-making. (*b*) Optical properties of a large range of glasses. (*c*) General physical and chemical properties of glass and glassware for scientific and industrial purposes. (*d*) Testing and standardising of glassware. (*e*) Workshop technique. (*f*) X-ray glass apparatus. (*g*) Optical calculations and lens designing. (*h*) Optical instruments. (*i*) Translation of foreign works on optics. The Standing Committee does not propose to limit itself to these subjects, but is prepared to consider and report upon the necessity for investigation in other directions relevant to its terms of reference. Manufacturers who have experienced difficulties requiring investigations for their solution in connection with the subjects of glass and optical instruments, or who desire to make suggestions for special researches on these subjects, are invited to communicate in the first instance with the secretary of the Research Department, Great George Street, Westminster, S.W., who will direct the correspondence into the appropriate channels for attention.

THE Food Controller has appointed the following committee of manufacturers of sulphate of ammonia to advise him on questions affecting its production and distribution, and to give effect to an approved scheme for regulating the distribution of supplies to farmers in all parts of the United Kingdom:—Mr. D. Milne Watson (chairman), Mr. W. Fraser, Mr. E. J. George, Mr. W. R. Hann, Mr. N. N. Holden, Mr. A. K. McCosh, Alderman F. S. Phillips, Mr. A. Stanley, and Mr. F. C. O. Speyer, secretary.

THE Director of Army Contracts, War Office, has issued a circular letter to timber merchants directing attention to the fact that the Army Council has assumed control of all stocks of soft wood, planed and unplaned, excluding pit-props, in the United Kingdom. This step has been taken owing to the urgent necessity of safeguarding essential supplies of timber for military purposes, and in view of the growing scarcity of tonnage it is imperative that existing stocks of wood shall be conserved to the utmost, and that no wood shall be consumed for any purpose not essential or where any substitute for wood can be utilised. Pending further regulations, which will be drawn up in consultation with the Timber Trades Federation, dealings in the timber referred to will be permitted, subject to the conditions laid down in the letter.

MAJOR P. A. MACMAHON has been elected president of the Royal Astronomical Society in succession to Dr. R. A. Sampson.

THE gold medal of the Royal Astronomical Society has been awarded to Prof. W. S. Adams, of the Mount Wilson Observatory, California, in recognition of his research work and papers on solar and stellar spectroscopy.

A BRANCH of the Ministry of Munitions, to be known as the Munitions Petroleum Supplies Branch, has been established. It will deal with the provision and distribution of petroleum and similar mineral oils for the purposes of the Ministry, and be under the direction of Mr. E. Houghton Fry. Sir Boverton Redwood has consented to take charge of the research section, and will be known as Director of Munitions Petroleum Research.

THE Marquess of Crewe has been appointed a member of the Committee of the Privy Council on the Organisation and Development of Scientific and Industrial Research.

THE following awards of the Society of Engineers (Incorporated) were presented on February 5: The president's gold medal to Prof. C. G. Cullis for his paper on "The Mineral Resources of the British Empire as regards the Production of Non-Ferrous Industrial Metals"; the Bessemer Premium to Prof. W. G. Fearnsides for his paper on "The Mineral Requirements of the British Iron and Steel Industries"; the Bernays Premium to Prof. J. A. Fleming for his paper on "Engineering and Scientific Research"; the Nursey Premium to Mr. J. E. Lister for his paper on "Modern Coal and Coke Handling Machinery as used in the Manufacture of Gas"; and the Society's Premium to Mr. Ewart S. Andrews for his paper on "The Design of Continuous Beams."

THE Alvarenga prize of the Swedish Medical Association for 1916 has been awarded to Dr. E. Nilsson for his study of the physical development and fitness for military service of the young men of Sweden between the years 1861 and 1913. The jubilee prize of the association has been won by Mr. H. B. Lundborg for his medical-biologic study of generations of certain Swedish families.

THE following have been elected as the officers of the Optical Society for the year 1917–18: *President*, Mr. F. J. Cheshire; *Hon. Treasurer*, Mr. H. F. Purser; *Hon. Secretary*, Mr. W. Shackleton; *Hon. Librarian*, Mr. J. H. Sutcliffe; *New Members of the Council*, Mr. L. G. Martin, Dr. W. Rosenhain, Mr. T. Smith, Mr. F. Twyman, Dr. R. Mullineux Walmsley, Mr. R. S. Whipple, and Lt.-Col. A. C. Williams.

THE annual general meeting of the Institution of Mechanical Engineers will be held at the Institution of Civil Engineers, Great George Street, Westminster, at 6 o'clock to-morrow evening, when the annual report of the council will be presented, and a paper read by Dr. W. Mason entitled "Alternating Stress Experiments."

THE trustees of the late Lord Kitchener have loaned to the London County Council, for exhibition at the Horniman Museum, Forest Hill, the collection of Eastern weapons and armour made by Lord Kitchener. Most of the weapons of northern India, and of the advanced peoples of other parts of India, are represented in the collection, together with a few from Persia, China, Japan, the Sudan, and elsewhere. The collection is in course of arrangement, but may be seen whenever the museum is open to the public.

WE regret to have to record the death, on Sunday last, at the age of sixty-nine years, of the Duke of Norfolk, Chancellor of the University of Sheffield.

THE *Aurora*, under the command of Capt. J. K. Davis, with Sir Ernest Shackleton on board, arrived at Wellington, N.Z., last Friday, bringing the survivors of the Ross Sea party of the Imperial Antarctic Expedition. A despatch from Sir Ernest Shackleton to the *Daily Chronicle* amplifies the brief account sent by wireless last week, which announced the death of Capt. Macintosh, Mr. V. G. Hayward, and the Rev. A. P. Spencer Smith. Between January and March, 1915, this party of men had been engaged in laying depôts as far as 80° S. lat. in anticipation of Shackleton's cross-continental journey. On March 14, 1915, one sledge party returned to Hut Point three days after the *Aurora* had been forced to move to Cape Evans on account of MacMurdo Sound freezing. Eight days later the second sledge party returned, badly frost-bitten, and having lost all their dogs. Open water or thin ice prevented their reaching Cape Evans until June 1, when they found the *Aurora* had gone. The winter was spent in the hut at Cape Evans. Provisions were abundant, but coal was short, as the main coal supply had been washed away soon after being landed. Blubber, however, served as fuel, and the deficiency in clothing was made good from the materials left by the Scott expedition. In September, 1915, a sledge party again set out for the south, and a depôt was successfully laid near Mount Hope, at the foot of the Beardmore Glacier, on January 26, 1916. Two of Capt. Scott's sledges were found. On the return journey scurvy appeared among the party, and Capt. Macintosh and Mr. Spencer Smith were seriously affected. Near One Ton Depôt they were overtaken by a furious blizzard, just as Scott was, from February 17 to March 1, but they decided to push on, as their provisions were very short. Forty miles from Hut Point the strength of the six men was almost exhausted. Capt. Macintosh then elected to be left behind to give the others a chance, as neither he nor Spencer Smith could walk, and had to be carried on sledges. The following day (March 9) Spencer Smith died, and two days later Hut Point was reached. A relief party succeeded in bringing Capt. Macintosh back in safety. Early in May the ice between Hut Point and Cape Evans seemed thick enough for travel, and Macintosh and Hayward, who had by that time recovered from scurvy, set out to reach Cape Evans, but broke through thin ice on the way and perished. The winter of 1916 was spent in sledging stores from Shackleton's old hut at Cape Royds to Cape Evans, in view of a possible third winter of detention. On January 10 this year the *Aurora* arrived at Cape Evans and picked up the seven survivors, H. E. Wild, E. Joyce, A. Stevens, Cope, Gaze, Richards, and Jack. No new geographical discoveries were made and none were expected, for this Ross Sea party was merely a supporting one in the event of Shackleton crossing the continent. However, the meteorological records will prove of great value.

BY the death of Dr. C. V. Burton on February 3, owing to an accident at the Royal Aircraft Factory, the country loses a mind of great originality and power. In 1891, when his strain figure theory of the constitution of matter was first published, he was only twenty-four years of age, and had already shown his capability as an investigator. During the next four or five years he added greatly to his reputation by his papers on the propagation of explosive waves through gases, on the rise of pitch of the note of a tuning-fork as it dies away, and on the mechanism of electrical conduction in metals. In 1905 he gave in these columns an account of his researches on the artificial production of diamonds, and three years later investigated the pressure oscillations in an atmosphere subjected to periodic heatings and coolings.

In 1909 he developed a suggestion of Prof. Hicks into a "pulsation theory" of gravitation. Problems connected with gravitation and with the relations between matter and ether occupied his attention during the succeeding years, his papers appearing in the *Philosophical Magazine*. With the analytical powers necessary for the prosecution of these researches Dr. Burton combined an insight into the construction and capabilities of instruments which made his position almost unique. His micro-azimometer may be taken as an example of his powers as a designer of instruments. The necessity for an instrument of great sensitiveness arose out of his search for a possible effect of the motion of the earth on the azimuth of a thin metal sheet suspended *in vacuo*, a search on which he was still engaged when the war broke out. An echelon grating, built up of reflecting elements and having a resolving power in the neighbourhood of the D-line of more than two millions, was also under construction by Dr. Burton, and shows his great skill. From the time when he was a demonstrator in physics at University College, London, Dr. Burton was an active member of the Physical Society of London, and his quiet manner and clear method of exposition made him a valuable asset at any meeting he attended.

CHARLES OWEN WATERHOUSE, whose death, at the age of seventy-three, was announced in NATURE of last week, was an entomologist of a type which, in these days of specialisation, is gradually becoming rarer. Few entomologists of his time had a wider or more varied knowledge of insects, although, as a specialist on the Coleoptera, he probably published less work than did many of his contemporaries. His papers were very numerous, and the mere titles of them would fill some pages, but the majority of them were very short, and related chiefly to species which, possessing some exceptional or striking character, attracted his attention. These species were drawn from almost every family of Coleoptera, and not a few belonged to other orders of insects. He was not fond of descriptive writing, and, in fact, wrote comparatively little, his most sustained effort in this direction being his contribution on the Buprestidæ to the "Biologia Centrali-Americana," in which he had to deal with 434 species, 300 of which were new. The morphological side of his subject seemed to have the greatest interest for him, and he often turned to it as a relief from the monotony of arranging long rows of specimens in cabinet drawers, or writing out pages of descriptions. His hands were at all times rather shaky, and it was wonderful to watch with what great success he could carry out the most delicate piece of manipulation. In his later years he co-operated with the late Fred Enock in collecting and studying the Mymaridæ—parasitic Hymenoptera of the smallest dimensions, some of which could pass readily through the eye of a needle. The exhibited series of insects in the insect gallery of the Natural History Museum, the guide-book to this series, and the many drawings, diagrams, models, and explanatory labels were nearly all prepared by him or under his direction, and afford some of the best evidence of the value of his work. He must have commenced his study of entomology at a very early age and under the most favourable auspices. His father, G. R. Waterhouse, the friend of Darwin and Owen, although officially connected with the British Museum as keeper of the Department of Geology, was himself almost more distinguished as an entomologist than he was as a geologist. Mr. Waterhouse entered the British Museum as an assistant in 1866, and from 1905 until his retirement in 1910 was assistant-keeper of the Zoological Department, and head of the Entomological Section. Just before his retirement the Companionship of the Imperial Service Order was conferred upon him.

THE death is announced at the age of sixty-seven of Rai Bahadur Sarat Chandra Das, C.I.E., the Bengali explorer of Tibet. In his younger days he was a schoolmaster at Darjeeling, and at the age of thirty paid his first visit to Tibet. In the following year he explored the Yarlung valley and Lake Palti and visited Lhassa. In 1882 he accompanied the late Mr. Macaulay on his mission to Sikhim and the Tibetan frontier, and in 1885 he again accompanied Mr. Macaulay when he went to Peking to ask permission of the Chinese Government for a mission to enter Tibet. For his services on this occasion Chandra Das was awarded the C.I.E. In 1888 the Royal Geographical Society awarded him the Back bequest for his geographical researches. For political reasons his researches in Tibet were not published until 1902. He was a great student of Buddhist writings and the founder of the Buddhist Text Society of India. Chandra Das was a man of great ability and conspicuous daring. To his initiative and courage is due much of our knowledge of the Indian frontier lands.

WE regret to note from the *Engineer* the death of Mr. James Gilchrist, chairman of Messrs. Barclay, Curle and Co., Ltd., of Glasgow. Mr. Gilchrist was born in Glasgow in 1847, and was associated with his firm for about fifty-five years. The ocean-going motor-ship—the *Jutlandia*—was built and engined by his firm in 1912, and was the first vessel of this class built in the United Kingdom. Mr. Gilchrist was a member of the Clyde Navigation Trust.

THE death of Mr. Isaac John Mann is also announced in the *Engineer*. Mr. Mann was educated at Trinity College, Dublin, and was for several years assistant engineer to the Dublin Port and Docks Board. He was associated with Sir John Fowler in the construction of Rossclare Harbour, and was afterwards resident engineer at the harbour construction works at Fishguard. He was a member of the Institution of Civil Engineers, and was awarded a Telford premium for his book on the formation of river bars.

THE death is announced in *Science*, at the age of 105, of Mr. John Finlayson, after whom Finlayson River and Finlayson Lake in Yukon Territory were named. Finlayson was a gold miner in California and Oregon until he was eighty-six years old, and then did much pioneer exploration work in British Columbia and Yukon Territory.

THE death is announced of Mrs. P. Amaury Talbot, wife of the District Commissioner of the Nigerian Political Service, and author of "Woman's Mysteries of a Primitive People: the Ibirios of Southern Nigeria." Mrs. Talbot travelled extensively, accompanying her husband for many years on all his journeys.

THE lecture given before the Aeronautical Society on February 7 by Mr. F. Handley Page on "The Case for the Large Aeroplane" reminds us that after the war the problem of the large aeroplane will assume even greater importance than at present. The demand in war time is for a machine having high speed and good climbing powers, but after the war the problem of using large aircraft for the transport of passengers and mails will certainly receive much attention. The success of the large aeroplane depends more upon constructional questions than upon aerodynamics. A large machine can be designed which is certainly not inferior to the small ones from a purely aerodynamic point of view. The same performance can therefore be secured if the weight of the machine and the horse-power are proportional to the wing area, *i.e.* to the square of the linear dimensions. If it be assumed that engines of the same weight per horse-power are used, the problem resolves itself into that of constructing large machines with a sufficient factor of safety, and with the actual constructional weight proportional to the wing area. Whether this can be done or not is an open question; Mr. Handley Page is of the opinion that it is possible. Of course, it must further be remembered that, in peace time, the same high performance in speed and climb will not be so necessary as it is for war purposes, and this will materially simplify the problem of building larger machines.

After the first day or two of February a change occurred in the character of the cold weather which had been so persistent since the commencement of January, and the night frosts, which were at first of a very mild character, became generally severe over Great Britain. In the Midland district of England the sheltered thermometer fell below zero at well-equipped stations. The reports from the health resorts which are issued daily through the Meteorological Office show 2°, or 30° of frost, at Ross-on-Wye, while at coast stations the thermometer in the screen registered 12° at Southport and Skegness, 13° at Aberystwyth, 17° at Yarmouth and Weston-super-Mare, and 18° at Eastbourne and Dover. The lowest temperature recorded at South Kensington was 21°, but the thermometer fell 5° lower in parts of the London suburbs, on higher ground. Frost had become more general and was more severe than on any occasion since the winter of 1894–95, but the intense cold was much less continuous. A break in the frost occurred over Scotland and the northern districts of England towards the close of last week, and by the commencement of the present week it had extended to all parts of England, although the thaw at first was by no means rapid.

The report of the Medical Officer of the Local Government Board for 1915–16 has recently been issued. So far as infectious diseases are concerned, with the single exception of measles, the record of 1915, like that of 1914, remained favourable. Eighty-one cases of smallpox occurred, but the disease failed to obtain more than a temporary footing in any district. More than a million and a half tubes of vaccine lymph have been distributed from the Board's establishment. The work of the medical department has centred chiefly around the military position, and a dual problem has arisen with regard to several infectious diseases: the increased risk arising within the United Kingdom, and the increased risk of the importation of infection. Dr. Bruce Low contributes to the report an account of the epidemiology of acute anterior poliomyelitis (infantile paralysis) in recent years. A number of reports on scientific investigations undertaken for the Board have been unavoidably postponed, but Drs. Eastwood and Griffin have contributed a report on the characteristics of tubercle bacilli in human bone and joint tuberculosis, and Dr. Griffin one on bovine actinomycosis in which he shows that the disease occurring among cattle in this country is frequently identical with the special form described by Lignières and Spitz in Argentina as actinobacillosis.

In the January issue of *Man* Sir Hercules Read describes two interesting bronze castings of Siberian or Scythian work and a monstrous animal in jade, the castings having been presented to the British Museum by Mr. Louis Clarke, the jade figure the property of Mr. Oscar Raphael. In one casting an animal with a horse-like body, griffin head, and ibex-like horns stands calmly while a wolf-like creature bites its foreleg. The second represents a combat between a lioness and an eagle. The jade figure shows an animal in a crouching posture. The recent work of Mr. Minns, "Scythians and Greeks," supplies much information which helps towards the interpretation of these objects of art, which are of special interest because many well-known features of our pagan Saxon art, and that of Western Europe generally, have their roots in the Siberian culture, and it is claimed that Carlovingian art is equally in its debt.

The object of the elaborate monograph by Dr. H. B. Ferris, reprinted from vol. iii. of the Memoirs of the American Anthropological Association, on the Indians of Cuzco and the Apurimac, is to provide materials for the solution of some important problems: the derivation of the Peruvians; the time of their advent into the country; the extension and physical characteristics of the Aymara and Quichua; and the cultural relations of the Peruvian to the Argentine and Chilean aborigines. Dealing with the pure Quichuas, the author finds them to be mesocephalic, and in very large proportion hypsicephalic, the facial index being similar to that of the North American Indian. The results are not worked out in detail, but he arrives at the interesting conclusion that "in many of the body proportions and in some physiognomic characters the Quichua resemble certain North American Indians."

Mr. E. J. Weyland, in *Spolia Zeylanica*, vol. x., part 38, describes and figures the canine and the first left upper molar of a horse found in a bed of grey sandy clay at a depth of 23 ft. below the surface during the digging of a trench by the Colombo Drainage Works at Wellawatta. The author inclines to the view that these teeth represent a Pleistocene species scarcely distinguishable from the existing horse, but for which he proposes the name *Equus zeylanicus*. The author discusses at length the possibility that horses may have been introduced into Ceylon by human agency, but is of opinion that the evidence, on the whole, justifies the assumption that they entered the island with the elephant by means of a land-bridge.

Prof. Clayton Smith, of the University of California, contributes to the *American Naturalist* for January a valuable summary of his experiments on the comparative resistance of Prunus to Crown gall. This disease, known also as plant tumour and plant cancer, is due to the presence of the motile *Bacterium* (*Pseudomonas*) *tumifasciens* in the cells at the point where the root is given off from the trunk. By artificially inoculating various forms of Prunus with pure virulent laboratory cultures, he sought to find a suitable resistant stock which could be adapted to the propagation of the stone fruits. The variety known as Golden Beauty, *P. hortulanum*, has so far shown more marked resistance than other varieties of the species hitherto tested, and it further displays a number of excellent qualities that would recommend it as a stock. *P. pumius* is entirely resistant to artificial inoculation, which constitutes a far more severe test than obtains under the usual field conditions. The work conducted to the present shows that seedlings of the German and Italian prunes might be promising stock for certain of the stone fruits, probably of the *domestica* type. However, no definite recommendations can be given, as the work is now only in its preliminary stages.

IN *Physis, Revista de la Sociedad Argentina de Ciencias naturales* (No. 11, tome ii.), an account is given by Ana Manganaro of cleistogamic flowers in *Ranunculus hilairei, Cardamine chenopodifolia,* and *Trifolium argentinense.* The article is illustrated by photographs of the plants showing the cleistogamic, or self-fertilised, flowers, and the way in which they bury themselves in the ground. In the Ranunculus these small flowers are produced in the axils of the outer radical leaves, and the flower stalks bend over and lengthen, carrying the developing fruits underground. In the Cardamine the contrast between the normal flowers borne on long inflorescences and the small abnormal flowers borne in the axils of the leaves of the basal rosette is very striking. In the Trifolium the abnormal heads contain some five to eight flowers, whilst the normal ones contain as many as thirty.

M. DE MONTESSUS DE BALLORE, the director of the Chilean Seismological Service, recommends that scales of seismic intensity should be abandoned (Bull. Seis. Soc. America, vol. vi., 1916, pp. 227–31). The suggestion, if carried out, would involve the disappearance of isoseismal lines from our earthquake maps. He would retain only the following lines:—The curve which bounds the disturbed area, and those which surround the places of greatest intensity and the area of damage. The last-mentioned curve would be fairly definite, but the first would be illusive, for the perception of a shock depends on certain accidental conditions. An earthquake which occurs on a Sunday afternoon, for instance, will be felt over twice the area of one in the middle of a weekday.

IT is commonly taught by the agricultural chemist that one of the many useful effects of an application of lime to the soil is the bringing into solution of a portion of the potash contained in the soil. The present lack of potash manures has, indeed, caused stress to be laid upon the increased use of lime or calcium sulphate as one means of drawing more rapidly upon the potash reserves of the soil. The assertion seems, however, to rest upon a very slender basis of evidence, and, as regards a certain type of soil, is directly challenged by Messrs. L. J. Briggs and J. F. Breazeale in the *Journal of Agricultural Research,* vol. viii., No. 1 (January, 1917). In experiments with orthoclase and pegmatite, and also with soils of granitic type, they failed to detect any increase of the solubility of the potassium on treatment with various proportions of calcium hydroxide or sulphate. In the case of orthoclase and of one of the soils, the presence of calcium sulphate in solution actually depressed the solubility of the potassium, the quantity of the latter in solution decreasing progressively as the concentration of the calcium sulphate increased. These results were fully borne out by the amounts of potash taken up by wheat seedlings grown in the respective solutions. The experiments thus indicate that the availability to plants of the potash in soils derived from orthoclase-bearing rocks is not likely to be increased by the application of lime or gypsum.

AN interesting article on "The Training of an Analyst" is contributed to the *Chemical News* for January 26 by Mr. Frank Browne, who was formerly Government analyst at Hong Kong. Mr. Browne ventures to assert that a chemical student may leave college with a good degree and yet know little of the practical side of the analytical profession. Such a student, going directly into a works laboratory or that of a public analyst, will probably in the course of time acquire sufficient experience to become very useful so long as his scope is limited to routine analyses. But, given a sample of unusual kind for analysis, he may be found wanting on account of lack of training in good, rapid analytical methods. The training of an analyst should be such that from a work of reference he can devise an analytical method for any strange sample and apply it successfully without interfering overmuch with his routine duties. Emphasis is laid on the fact that, by careful study, nearly any system of analysis can be shortened to a remarkable degree, and some methods of doing this are indicated. The author strongly supports Mr. A. Chaston Chapman's recommendation that to the curriculum of chemical students who intend to become professional chemists a year should be added in which they would be trained under conditions resembling those of a technical rather than those of an academic laboratory. He suggests that the programme for the year should include analyses of water, fuel, oils, fats, and waxes, alcoholic liquids, metals and alloys, whilst a good working knowledge of the microscope, polarimeter, refractometer, and spectroscope should be acquired. It is also desirable that the student should have a sound knowledge of the British system of weights and measures.

WE are asked to say that the work of Prof. Percy Groom upon the Indo-Malayan Yang wood (Dipterocarpus sp.), referred to on p. 450 of NATURE for February 8, was carried out at the Imperial College of Science and Technology, and not at the Imperial Institute as stated in the article.

THE spring list of announcements of the Oxford University Press (Mr. Humphrey Milford) includes: "Three Lectures on Experimental Embryology," the late Capt. J. W. Jenkinson, with a short biographical notice of the writer by Dr. R. R. Marett; "The Beginnings of English Overseas Enterprise," Sir Charles P. Lucas, with notes, references, and an appendix of the First Charter to the Merchant Adventurers; "Sir Walter Raleigh: Selections from his 'History of the World,' Letters, and other Writings," edited, with introduction and notes, by G. E. Hadow, with maps, a portrait, and a facsimile of his handwriting; "The Casting Counter and the Counting-Board: A Chapter in the History of Numismatics and Early Arithmetic," F. P. Barnard, illustrated; "Education To-day and To-morrow," P. Matheson; "The Origin and Meaning of Some Fundamental Earth Structures," C. F. Berkey; "Milk Production Cost Accounts: Principles and Methods"; "Aristotle: Meteorology," edited by F. H. Fobes; "The Order of Nature," L. J. Henderson; "An Adequate Diet," P. G. Styles; "Calculus of Variations," W. E. Byerly; "Organism and Environment," J. S. Halldane.

## OUR ASTRONOMICAL COLUMN.

A GREAT SUN-SPOT.—A group of spots large enough to be seen with the naked eye has been visible on the sun during the past week. A writer in the *Times* of February 9 describes it as one of the largest groups ever photographed at Greenwich, and gives the heliographic co-ordinates as long. 10°, lat. 15° south. It is further stated that the disturbed area was 125,000 miles long and 64,000 miles broad, and consisted of two very large spots connected by a group of small ones. The diameter of the preceding spot was 35,000 miles, that of its umbra being 13,000 miles. The following spot was larger, with several umbræ. The spot passed the central meridian on February 9 and will remain visible until February 15, when it will be near the west limb.

Prof. Fowler informs us that on February 7 observations with the spectroscope indicated great activity, especially among the smaller connecting spots; in this region many brilliant reversals of the H$\alpha$ line were noted.